MAKING A SPLASH
An exciting new build from Francis-Jones Morehen Thorp

SHAPING THE FUTURE
Breathing new life into a former coal mine site

DAYTONA RISING
One venue; 57 years of NASCAR history

AIMING FOR NET-ZERO
Leading the way in a future of sustainable building
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Kingspan strives constantly to deliver innovative, sustainable and affordable product solutions to customers developing buildings that perform perfectly all over the world today. Passionate about the issues and challenges presented by sustainable construction, we have created Kingspan Magazine to bring together thought leadership pieces from industry experts, case studies that inspire, product information that stimulates ideas to break new boundaries, and so much more.

We hope you enjoy this first issue and would love to hear your views.
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The mega trends are not just large, but intertwined and deeply connected. The tech savvy Millennials are demanding that companies they work for and buy from embrace sustainability. New technologies will be critical for making progress on our big environmental and social challenges. And economic growth won’t happen without sustainability – and vice versa. Business will need to change fast to deal with such a volatile, and exciting, mix of forces.

Andrew Winston, strategy adviser, author of The Big Pivot & Green to Gold

Impact on the Construction Industry

Consolidation of suppliers and contractors, more regulation, more creative financing of projects that give accessibility to both investors and purchasers, the need for flexibility and adaptability are all facets of the changing face of the global construction sector. There’s also a growing investment into security (work site and cyber). Investment also continues into digital, integrated project management systems all geared to maximise efficiencies, lead times, site safety and overall predictability of scheme delivery. Shortage of skilled labour will continue to plague construction companies – a significant number left during the recession and have not returned. As companies struggle to staff sites and schedules shorten, many are turning to prefabricated, off-site construction methods thus reducing waste, increasing predictability and offering potential costs savings (US$).

Impact on the Construction Industry

Although BIM has dominated tech conversations in the construction sector, experts point to laser scanning, as an emerging technology that will impact. 3D laser scanners can create a digital reproduction of the dimensions and positions of objects in a certain space and then turn the information into a point cloud image. Paper is so last year! Mobile apps with geo-fencing will boom. With so many contractors relying on time-tracking software, geo-fencing will help site managers better manage supplier payments and their payroll. The use of other mobile apps – Red-Trac and Labor Sync etc. – is also likely to grow. And wearable technology has kept the running track and interactive construction gear of all sorts – the Smart Hardhat, safer safety vests, and more are driving up site safety and efficiencies. While VR (virtual reality) and AR (augmented reality) visors are still rare sights on site, architects are finding uses for the headsets in the design phase.

Read more about BIM with David Flynn, Dip Arch Tech, Director at designtech on page 14.

Impact on the Construction Industry

The impacts of digital disruption are now so pervasive that no business in any sector – from the smallest family business to the largest multinationals – is immune from them.

Bob Moritz, PwC

US Senior Partner

By 2025 the world’s population will rise by

1bn

3. Demographics… mass move to urban living

• Growing, aging population
• Urbanisation
• Rich-poor gap
• Migration
• Health challenges

The changing needs of the global population are impacting residential, commercial and infrastructure projects. Homes need to adapt to more single occupancy, smaller family units, shared living and co-ownership, more home-workers, and an aging population – all requiring safe, affordable and accessible environments in local amenities. Mega cities in both developed and developing regions will require clever planning and design; condensing space while preserving comfort and security for living accommodation and logistic facilities, leisure and retail buildings that support the community. Changing habits will also drive changes, e.g. in the USA, 18-24 are largely forgoing cars and fewer teenagers are getting licenses. This suggests fewer new parking projects will be coming up; however, existing spaces may be repurposed into other functional structures, which presents further opportunity to the construction industry.

Impact on the Construction Industry

The global economy is predicted to grow by just over 3% per annum 2017-2050, double in size by 2057 and almost triple by 2059. Power is shifting towards Asia and a group of fast growing, emerging economies called the E7 (Brazil, China, India, Indonesia, Mexico, Russia and Turkey), resulting in a whole new group of middle class, global citizens with higher aspirations and greater spending power. Urbanisation is leading to economically rich mega cities, mega regions, and mega corridors, e.g. Booth’s area connecting Washington DC and Boston). The rapid and widespread influence of technological advancement is challenging the status quo of world economics as never before. The rate for talent is increasingly fierce, requiring greater workforce mobility and diversity for a competitive advantage and as a global marketplace becomes firmly established, there will be a growing need for linked financial systems, and as a global marketplace becomes firmly established.

3% per annum 2017-2050

Impact on the Construction Industry

Rapid technological progress is one of the biggest disrupting forces in our world today. The time it takes from breakthrough technology to mass-market application is collapsing. Companies are becoming faster, smaller and more universal. Medical breakthroughs are prolonging and enhancing lives. New technologies embedded in our lives are changing the way we work and live and we are being forced to address ethics, privacy, transparency and the way we interact. Drones, robots, big data, the cloud and 3D printing are all of an increasing impact on our lives with the role of technology changing all industries, individuals, societies, business leaders and governments to adapt to the emerging risks and opportunities.

2. Technology... speed of advancement; the biggest disruptive force

• 3D printing
• Robotics
• Nanotechnology
• Drones for business
• Biotechnology
• Mobile first

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to grow by just over 3% per annum 2017-2050, double in size by 2057 and almost triple by 2059.
**MEGA TRENDS**

Noun: a pattern or a movement that has a major impact on business and society as a whole. Kingspan Magazine shares some of the most significant highlights of the key global mega trends and examines how these may impact the construction landscape now and in the future.

### 1. Economics... a global market place

- Interdependency
- Global integration
- New, agile players
- Increasing debt
- New world order

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Rapid technological progress is one of the biggest disruptive forces in our world today. The time it takes from breakthrough technology to mass-market application is collapsing. Convergence is becoming faster, smaller and universal. Medical breakthroughs are prolonging and enhancing lives. New technologies embedded in our lives are changing the way we work and live and are being fired to address new challenges. Privacy, transparency and the way we interact. Diversity and connectivity, cross-cultural adaptation is driving a mobile first world. Drones, robotics, big data, the cloud and 3D printing are all having an increasing impact on our lives with the role of technology change is forcing individuals, societies, business leaders and governments to adapt to the emerging risks and opportunities.

### 3. Demographics... mass move to urban living

- Growing, aging population
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- Health challenges

Another billion people will join the world’s population by 2025, making an estimated total of 8bn - with 5.5bn forecasted by mid-century. Growth will come largely from the developing world. It is areas least capable of supporting the increase. We’re living longer and having fewer children. As a result, the fastest growing segment of the population will be the over 65s. Significant population growth in emerging markets and ageing is a key trend. In developed regions will continue to fuel the power shift. An increasing move to urbanising continues – currently 50% of the world’s population lives in cities, with 5bn expected by 2050. At the same time, growing levels of poverty, inequality and health challenges exist with obesity and malnutrition polarising nations.

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The impacts of digital disruption are now so pervasive that no business is immune from them. – is immune from them.
Impact on the Construction Industry

Buildings that adapt to people and their living/working patterns will be a major evolution leading to more productive environments, higher levels of satisfaction and comfort for occupants, and more flexibility for owners and facilities managers. Think hot-desking, crash-pads for sleeping, and micro living units. The advance of the Internet of Things (IoT) is a major trend in building management and the growing availability of data that will lead to new solutions. More discerning, values-based consumers will be increasingly concerned about the ethics of their spaces, the materials they are made of and the designers and builders who envision and create them. Opinion on the extent that IoT and ‘Green/SMART buildings are global trends, however, most agree that the future of building design is likely to take a western approach in the foreseeable future, with priorities in developing countries focused on the more basic and affordability factors.

Sources:
1. http://www.pwc.co.uk/issues/megatrends/megatrends
The changes we are likely to see to our society and environment over the next two decades and beyond will require a paradigm shift in the economy and society. The companies that recognise and plan for it now will be the winners of the future. We need to think now about how business services will evolve in the next two decades and beyond. The opportunities are real for those who help create a sustainable future.

Ian Chechiere, Group CEO, Kingfisher plc

4. Environment and Sustainability... growing consciousness and energy to address

- Natural resources stretched
- Climate change
- Species under threat
- New legislation
- Compliance

As the population increases and becomes more urbanised and prosperous, demand for energy, food and water is rising. The strain on scarce resources is compounded by the detrimental impact this is having on our climate. While non-renewable resources technically finite, new technologies continue to impact future supply by allowing access to previously inaccessible land, gas, and coal reserves. This is driving businesses to adapt and innovate in order to benefit from the shifting supply environment. SMART is the new GREEN! We're replacing early ethical products and services with new solutions that are connected and able to sense, process, report and correct.

The SMART city market will be worth $1.5tn by 2020. Society, the impact of Gen Y, and online sales, out of which online is expected to be 19%, will be a major evolution leading to more productive environments, higher levels of satisfaction and comfort for occupants, and more flexibility for owners and facilities managers. Think hot-desking, crash-pads for sleeping, and micro living units.

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By 2020 the SMART city market will be worth...

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Impact on the Construction Industry

More commercial contracts will be green and focus on sustainability. This is being driven by increasing legislation, government mandates for green buildings, calls for the use of renewable power and design innovation, and fueled by suppliers and buyers with a corporate, eco-social conscience.

McGraw Hill Construction suggests that 48% of all new non-residential construction projects will be green, a $54bn opportunity for construction firms. While green planning and design is easiest to implement for new construction, it is the retrofit and refurbishment of existing buildings ($4.6m in the UK alone!) that presents both challenge and opportunity.

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The brand new Galena retail and entertainment complex, located in the city of Joworzno in southern Poland, has given local residents a fresh and inspiring new focal point for their community. Previously a disused coal mine, the open site was perfect for the regeneration project led by specialist local developer, P. A. Nova. Kingspan Magazine finds out how BENCHMARK by Kingspan’s Rainscreen Façade System gave designers their ‘Eureka’ moment and how it was subsequently used to provide a unique balance of form and function for P. A. Nova’s scheme.

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Stanisław Lessar,
Designer, P. A. Nova
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**SHAPING THE FUTURE OF A FORMER COAL MINE**

Stanisław Lessaer, Designer, P. A. Nova

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Design vision

The Galena site covers a generous area of 26,700m². With an open aspect on all sides, the shape of the structure was critically important to ensure a seamless fit within the local environment. P.A. Nova general designer and Vice President of the Board, Stanisław Lessaer explained: “In the tradition of urban architecture, houses located along a street or standing alone create a pattern, which is usually punctuated by one or two distinct elevations. In the case of Galena, with it being freestanding in a public space and visible from all sides, we wanted to approach the design with the shape of the existing urban architecture very much in mind. It was important for us to create a rich experience for people seeing and using this building and the foundation for this was for us to consider carefully shape stratification, façade colour and form, differing levels of roof surfaces, location of entrances and highlights alongside all of the other architectural and construction details.”

Hero product led to pivotal project moment

With a rye smile on his face, Lessaer reflects back on the design/specification stage of the Galena project. He continued: “Knowing that the shape of the building and its façade were so crucial the team had been considering all kinds of alternatives. The decisive moment came during a meeting with members of the BENCHMARK by Kingspan team, who introduced us to the Rainscreen Façade System – a self-supporting, lightweight, insulated curtain wall, which can be clad without an additional substructure. It was the moment when we stopped thinking about the elevation as one of the major structural parts of the building and instead considered a pillar/ceiling system with light external curtain walls. From that time, we were able to refine the technical solutions and optimize the financial side of this project.”

Design + Build detail

Each product from the Rainscreen Façade System has its own benefits and standardized technical solutions. For Galena these were the starting point for the development of a detailed design for each façade. All aspects were considered, from optimizing the length and width of the materials through to designing numerous original new details with the BENCHMARK by Kingspan team. The Rainscreen Façade System serves as a warm curtain wall and substructure for individual solutions: HPL laminates in anthracite and lemon, Steel Mesh in silver, ACM panels in white - three basic materials, colours and textures create a 3D form. Some edges were highlighted to get the effect of irregularly spaced window openings. Elevations southwest and southeast are located 30–50m from the surrounding streets and are viewed as a whole, which is why the vertical BENCHMARK by Kingspan panels, underlined by colours were used.

The result

The materials and colours used for the elevations at the monumental entrance create an arcing, modern frontage above the streets and park as if inscribed into the surrounding urban layout. Ewa Bozkowska, President of the Board at P.A. Nova concluded. “We are returning this part of town to the local residents by providing them with both retail and entertainment in an inspired space that is fit for the future.”
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IN BRIEF
GALENA RETAIL AND ENTERTAINMENT COMPLEX

Location:
Joworzno, Poland

Products:
BENCHMARK by Kingspan Rainscreen Façade System

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- Insulated wall panel
- Rails
- Desired finish to create stunning façade
- Self supporting, lightweight, warm curtain wall
- Different finish and colour options
- Significant reduction of CO2 emissions
- Time Saved: Faster build speed, rapid building envelope closure and faster installation works inside
- Plus... Lifetime insulation continuity, thermal performance and airtightness.

 kingspanmagazine.com
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designtech is one of the UK’s leading Computational Building Information Modelling (BIM) Consultancy. Over the past 10 years, it has worked with industry specialists including architects, surveyors, software developers as well as structural and mechanical engineers to help deliver complex construction projects around the world. With the industry moving to employ BIM workflows from concept to construction, designtech Director, David Flynn shares his views on how this is impacting the Architecture, Engineering and Construction (AEC) industry.

K: What impact is BIM having on the world of architecture?
DF: The impact of BIM on Architecture is similar to the move from drawing board to Computer Aided Design. BIM represents a shift in the process and methodology that the construction industry currently takes for granted. Within the current paradigm, the agenda was to document architectural designs in a clear and concise manner, in order to support specifications and later to provide legible on-site guidance. As we move further into integrated BIM workflows, the expected level of detail in building documentation is increasingly high. Coupled with a renewed focus on interoperability, this highlights the need for a wide array of design tools and processes. BIM is allowing the industry to focus on interoperability between both software platforms and philosophies. In other words, we must learn to integrate the divergent processes of conceptual design, manufacturing, and construction in order to deliver safer, more cost-effective projects with certainty to clients.

What drives the adoption of BIM?
A number of factors are driving this transition to BIM. To begin with, the tools we use as designers and manufacturers are becoming more intelligent and ever more varied. Where perspectives and door schedules were once painstakingly hand-drafted, we can now digitally output 3D models, 2D drawings, beautiful visuals and an array of schedules, specifications and data. Designers are expanding their toolkit while contractors handle highly complex design problems using data visualised on-site. This can reduce risk and error in the delivery phase of a project, an opportunity contractors and their supply chains are seizing.

Are there any building sectors where BIM is more popular than others?
As is often the case, the initial burden of change has fallen to the larger sectors of our industry. Infrastructure design, for instance, has seen a significant uptake and development of BIM processes. This in turn trickles down to the wider commercial client base and other parts of the industry who seek to be involved in these highly complex projects. Integrating BIM within infrastructure projects has transformed a UK industry which previously yearned for clarity; this in turn has helped develop robust processes to be adopted by the wider construction sector, putting a particular emphasis on cost reduction, sustainable material choices, and risk and safety on site.
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What are the obstacles to the development of global standards in BIM? The work done to create a framework for BIM delivery in the UK has given governments and organisations around the world a solid foundation to work from. Due to regional quirks and a strong focus on local issues, a global approach to BIM is unlikely. Like electrical sockets, units of measurement, and operating systems, BIM will inevitably fall prey to the forces, which prevent a global norm. In the United States, for example, BIM standards have been produced but without a Government mandate, which means it is virtually impossible to apply them broadly enough to effect real change. The UK has the requisite mandate, and we are already seeing a shift within the design process, allowing us to work with our consultant teams in ways previously cumbersome and inefficient.

Proponents of BIM refer to cost savings derived from factors such as: improved visualization, better productivity and co-ordination, increased speed of delivery and improved lifetime asset management – what are your thoughts? During the design phase of a project time savings are facilitated through improved visualization, coordination and production tools on offer through BIM. However, this has categorically resulted in further design work, which explains the difficulty many architects have in articulating the ROI of moving to a BIM delivery process. When examining these effects on site, the impact of BIM is clear, allowing for better metrics of what can and has been saved. While we are seeing the design phase eating into the efficiencies offered by the process, we are using that time to improve the environmental attributes of a building, the way it measures up to the client’s brief and its ability to achieve long-term sustainability goals.

Design teams have seen tangible improvements in their ability to coordinate and produce documentation, again, allowing them to focus on areas such as sustainability and materiality. Collaborative BIM project teams visualize comprehensive 3D models with extensive embedded data, giving consultant teams access to more information with less time spent extracting and clarifying.

As an average % of the build cost, what typical savings do you see resulting from the use of BIM? When a project is completed we can begin to properly assess the ROI on the usage of BIM processes. On a recent project completed by my team, we estimated that the use of coordination tools reduced on site clashes by around 75%. The effect of this impacted most on the main contractor - reduced change requests meant around 5% cost saving on the project budget. It’s important to recognize that to maximize the potential benefits, BIM must be applied throughout the supply chain, but the cost savings can be quite substantial.

What is your general impression of construction material suppliers and their grasp of BIM? What do you see as their challenges and opportunities? There are clear benefits to manufacturers and suppliers when it comes to providing BIM content for the AEC industry, and our interaction with them has been positive. There’s an appreciation of increased business opportunity and collaboration with designers. Making products available to contractors and architects not only facilitates the specification of a given product, it places you front and centre. This is not always straightforward, owing to the fragmented nature of the software landscape. Do you create Revit content and hope that will cover enough of your market, or do you invest in developing for multiple platforms? Difficult questions which will be answered differently around the world. The lack of a global approach, as previously discussed, will influence how a company engages with the wider industry, but if you can provide the data within variable cost margins (consider it part of your marketing!) you will avoid becoming the sole provider who does not support the designers and construction experts in your region.

What about the future? Looking ahead, a wider transition to BIM must be considered as a significant opportunity. It is an opportunity to improve the quality of the spaces we create, an opportunity to do so with better materials and a better outlook to sustainability. And finally, the move will allow us all to contribute to a more integrated, data-rich, forward-looking process for improving our built environment.
We must learn to integrate the divergent processes of conceptual design, manufacturing, and construction in order to deliver safer, more cost-effective projects with certainty to clients.

What are the obstacles to the development of global standards in BIM? The work done to create a framework for BIM delivery in the UK has given governments and organisations around the world a solid foundation to work from. Due to regional quirks and a strong focus on local issues, a global approach to BIM is unlikely. Like electrical sockets, units of measurement, and operating systems, BIM will inevitably fall prey to the forces, which prevent a global norm. In the United States, for example, BIM standards have been produced but without a Government mandate, which means it’s virtually impossible to apply them broadly enough to affect real change. The UK has the requisite mandate, and we are already seeing a shift within the design process, allowing us to work with our consultant teams in ways previously cumbersome and inefficient.

Proponents of BIM refer to cost savings derived from factors such as: improved visualization, better productivity and co-ordination, increased speed of delivery and improved lifetime asset management – what are your thoughts? During the early stage of a project, time savings are facilitated through improved visualization, coordination and production tools on offer through BIM. However, this has categorically resulted in further design work, which explains the difficulty many architects have in articulating the ROI of moving to a BIM delivery process. When examining these effects on site, the impact of BIM is clearer. It places you front and centre. This is not always straightforward, owing to the fragmented nature of the software landscape. Do you create Revit content and hope that will cover enough of your market, or do you invest in developing for multiple platforms? Difficult questions which will be answered differently around the world. The lack of a global approach, as previously discussed, will influence how a company engages with the wider industry, but if you can provide your data within sensible cost margins (consider it part of your marketing!) you will avoid becoming the sole provider who does not support the designers and construction experts in your region.

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David Flynn, Dip Arch Tech Director, designtech

With 15 years of construction industry experience delivering highly complex projects in Europe, Asia and North America, David has spent the majority of his career helping practitioners to develop and execute their designs using efficient workflows. Prior to joining designtech, he was Global Head of BIM at Grimshaw Architects, and then CAD and BIM Manager at KPF and Al A, both London-based architects. One of David’s key professional attributes is his ability to focus on what makes design teams efficient, productive and aligned with their local industry standards.

More: designtech.io
The Midfield Terminal Building (MTB) at Abu Dhabi’s International Airport is quite simply breathtaking. Conceived as the primary gateway to Abu Dhabi and designed by Kohn Pedersen Fox (KPF) Associates, the new terminal building is raised above road level and appears to sit on its very own plateau. Imagine the arresting view of this impressive structure silhouetted against the desert sky, not to mention the spectacular illuminated six-storey interior that will be visible from the surrounding highways at night. Kingspan Magazine finds out about this cutting edge design project and learns how the Kingspan team continues to work seamlessly with Chadwick Technology and other key partners on the delivery of this ultimate tribute to luxury air travel.
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Project overview

The new MTB will transform Abu Dhabi International Airport into a world-class facility that can accommodate the expected growth in passenger numbers - up to 30m per annum - over the next decade. The 310,000m² terminal building comprises a reinforced concrete podium and multi-level basement with 616 bays of superstructure steelwork forming the vast span roof over the central space and four adjoining piers. The monumental departures hall – a 50m-high space in all weathers. Kingspan’s KingZip Linea and KingZip Infiniti products feature a layered structure comprising structural liner tray, vapour control barrier, mineral fibre insulation and external weather sheet with thermo support halters and galvanised top hat support bars running along each side of the sheet. The fluoropolymer and acrylic resin formulation provides a “Teflon type” surface which is resistant to dirt and easily washed. Managing Director of Kingspan, Lance Wilson, who had a lead role in the project, explained: “With any major project such as the MTB, we install mobile forming and curving equipment so that the roofing element can be manufactured on site. The ambitious nature of the MTB design – requiring curves, undulations, a bull nose from the head of the roof down on to the vertical cladding, piers joining the central part meant accuracy of shape and size was absolutely paramount. If you can imagine, each of the support halters along the roofing sheet had to engage exactly with steel structure below. Roll-forming on site was essential to get the exact shape and dimension to match the specification.”

Design + Build

Occupying such a critical part of the overall scheme, the roof element of the MTB presented the construction team with a significant challenge. Essentially a 3D structure had to be created from sheets of cladding with varying widths along each stretch in order to achieve the complex, multi-dimensional ‘wave’ design envisaged by the architect, KPF. It had to be UV-, abrasion- and corrosion resistant, withstand extreme temperatures, and have a non-stick, waterproof surface to perform in all weathers. Kingspan’s KingZip Linea and KingZip Infiniti were identified as ideal matches for the specification. Both products feature a layered structure comprising structural liner tray, vapour control barrier, mineral fibre insulation and external weather sheet with thermo support halters and galvanized top hat support bars running along each side of the sheet. The fluoropolymer and acrylic resin formulation provides a “Teflon type” surface which is resistant to dirt and easily washed. Managing Director of Kingspan, Lance Wilson, who had a lead role in the project, explained: “With any major project such as the MTB, we install mobile forming and curving equipment so that the roofing element can be manufactured on site. The ambitious nature of the MTB design – requiring curves, undulations, a bull nose from the head of the roof down on to the vertical cladding, piers joining the central part meant accuracy of shape and size was absolutely paramount. If you can imagine, each of the support halters along the roofing sheet had to engage exactly with steel structure below. Roll-forming on site was essential to get the exact shape and dimension to match the specification.”

Seamless relationships

With such a major and complex project, there are many partners involved in the MTB and the Kingspan team has worked flexibly alongside the different parties at all stages. Above all, Kingspan formed the closest working relationship with the building envelope subcontractor, Chadwick Technology, and together they helped turn the complex design vision into the landmark piece of civic architecture fitting its international status. Lance continued: “Chadwick is one of the world’s top roofing contractors and has extensive experience of working on large-scale airport projects. We’ve worked together many times in the past and have a very sound understanding of one another’s approach. Having such synergies was a major contributing factor to the combined team’s ability to work seamlessly and progress at speed to ultimately deliver one of the most aesthetically-pleasing projects in the world today.”

The scale and complexity of the MTB demanded that information be shared collaboratively in one online space. The project team estimate that IBM workflows saved them 119 days and USD$65,000 in creating fabrication drawings for just one zone of block work. They also cite enhanced collaboration, reducing the cycle of critical RFIs down from 28 days to just two-seven days. Working in a BIM environment enabled proposals to be tested virtually first before they were constructed for real out on site. The design team claim to have saved over USD$1m and 51,000 working hours purely in resolving clashes between the main façade and the various trades it interfaces with.

“...This is one of the most aesthetically pleasing, technically complex projects that I’ve worked on. The cutting-edge design set some significant challenges but overcoming these together with such a fantastic partner has been immensely rewarding. Our relationship with Chadwick spans many years and projects – they always deal with things in such a mature fashion and we resolve things smoothly on the ground to deliver what’s required.”

Visit kingspanmagazine.com
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Watch the video on how the 3D roll forming standing seam solution, Kingspan Infiniti can turn your vision into reality. Also read a case study on Jordan’s Queen Alia Airport. Visit kingspanmagazine.com
**ABU DHABI INTERNATIONAL AIRPORT**

**Location:** Abu Dhabi  
**Products:** KingZip Linea and KingZip Infiniti

**IN BRIEF**

Thermal performance  
- R-value: 3.77 m²K/W and  
- U-value: 0.265 W/m²K

Sustainable design  
- Designed to achieve a minimum of Estidama Two Pearl rating for sustainable design

Awards  
- Innovation in Comprehensive BIM (Be Inspired Awards 2013)  
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- Commendation, MIPIM Architectural Review 2007  
- Silver Central + Western Asia MIPIM Asia 2011

**Plus...**  
- Enhanced weatherability  
- Increased construction speed  
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**Manufactured on site from 1:150m lengths**

**Long sheets eliminate the need for end laps**

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**Image courtesy of Kohn Pedersen Fox Associates.**

kingspanmagazine.com
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22
It’s perhaps slightly unusual to begin an article focused on manufacturing with such emotive words at opposite ends of the scale. Isn’t it all about systems, processes, methods and measure? Talk to Mike Stenson, Operations Director for Central and Eastern Europe and Russia (CEER), and you quickly find that’s just one important part of the story at Kingspan. Behind its laser-focus on delivering solutions for customers, is a team of individuals unified in bringing their imagination, their passion and drive to the pursuit of perfection. Kingspan Magazine reveals the manufacturing story with a mighty human factor.

Kingspan has huge manufacturing know-how with almost 100 manufacturing facilities around the world. Today we talk to Mike Stenson the Operations Director for Kingspan Insulated Panels in Central, Eastern Europe and Russia. Mike Stenson has been in an operations role at Kingspan for over 10 years, prior to that he developed experience in the fast-paced electronics industry. It is immediately obvious that he embodies Kingspan’s clear sense of purpose to lead the field in high performance insulation globally by bringing innovative, solutions-led, proprietary technologies to the market. What is also apparent is Mike’s complete belief in his people and their ability to act as the catalysts for turning company goals into real solutions for customers. We asked Mike to share some of his thoughts:

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Kingspan Magazine: Starting with the background – tell us a bit about your approach to manufacturing generally?

MS: First, I should qualify what manufacturing covers across our ten sites at Kingspan CEER as I suspect it differs slightly from what people might expect. We encompass production, quality control, R&D and new product development, which put us in the best possible position to deliver standard products and tailored solutions based on those to our existing customers. It also means we can easily bring together resources from dedicated disciplines to collaborate on innovations for the future. We take an extremely disciplined approach to all that we do, which is underpinned by programmes such as Lean Manufacturing and Six Sigma, and registration to a number of important global standards. All employees at every level are encouraged to share our goal of pursuing perfection. They form the glue that enables us to consistently achieve so much. Our systems and processes are regularly audited by external agencies and we’re very proud that all our facilities are accredited to ISO9001, ISO14001 and OHSAS 18001 standards with all products being FM approved and carrying the CE mark.

As an operations person, who do you see as your customer?

I think of customers in two parts – external and internal. Without our external customers, there would be no solutions to find and no business to run, so we are absolutely laser-focused on understanding them, their businesses and their needs. We like to work in the most direct way possible with those customers who specify our products into their design schemes – engineering offices or architects, designers, specifiers, and also contractors. That way we get to understand their challenges first-hand, and have the best possible chance of getting them the right products, at the right price, safely on time and in full helps us to maximize our contribution; delivering the right products, at the right price, safely on time and in full helps to create a healthy, sustainable business that can continue to thrive as a customer and industry partner.

Kingspan has a reputation for excellence in manufacturing globally – can you tell us a bit about how this has come about?

Kingspan is not a company that looks for plaudits, however, across our facilities we have a team of very genuinely committed people working hard on the day-to-day operations while also focussed on improving all that we do to stay fit for the future. It’s this mindset and passion for finding even the smallest ways for us to get better that keeps us ahead.

How does all of this benefit your customers?

We have to ensure that our internal operations are totally geared to satisfying our customers. So first, our passion for manufacturing must translate into delivering perfect quality solutions for the projects that they are working on. If there’s ever a case where we do not live up to a promise we deal with it in away that the customer feels it is taken seriously and we handle it quickly and professionally. Our focus on efficient manufacturing also means we deliver predictability; meeting expectations on timing is critically important, which means talking to the customer and understanding their programme of work so that we act accordingly. Lastly, if our operations are running optimally, it means we can flex and adapt when things change. Projects sometimes take a different turn, new challenges arise but our customers know we are their partner and solutions provider in the truest sense. They have confidence in our word and in our ability to deliver to their exact needs.

How does your R&D team ensure it is working on the right value adding solutions for customers and the wider industry?

Again, I split this into two parts. First, our commercial teams spend the majority of their time with customers and on understanding the market and its challenges, and all of this rich knowledge feeds directly into our R&D team. Second, the internal operations team watches the market and our competitors to complete the 360-degree view. Being obsessed about product performance, of course means we are always considering ways in which we can stretch and enhance what we already have Working across countries and geographic borders ofen requires minor developments to ensure they meet local regulations. Our recent launch of QuadCore™ Technology™ is a good example of the way in which we bring together internal and external perspectives to develop a differentiated offer that brings a genuinely new set of benefits to the construction sector (QuadCore™ Technology profile appears on page 48 of this issue).

What factors are impacting the way manufacturing at Kingspan is evolving? How do you see things changing over the next 2-5 years?

There are many things we use to benchmark ourselves and constantly evaluate our operations. We have to be highly conscious of those as part of our mission to continuously improve, which is particularly important as we focus on being ever more responsive and flexible in the way we satisfy customers’ demands. If I had to pick out one factor that’s driving the pace of change, it is technology. Robotics manufacturing and 3D printing technologies and the use of big data, for example, have real potential to help transform how we work, not only in terms of our manufacturing processes, but also in the way we approach innovation, new product development and existing product enhancement. Looking further ahead, the use of online process controls during manufacturing, greater capabilities to collect and analyse data to pinpoint customer’s needs and wishes, the ability to offer auto order-tracking and other tailored digital services will give us an even better chance of enhancing our customers’ experience of working with us.
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Die-hard race fans have flocked to Daytona Beach in Florida as far back as 1903. Since 1959, they’ve gathered at the Daytona International Speedway® track for the National Association for Stock Car Auto Racing’s (NASCAR) annual lineup of action-packed events including the DAYTONA 500®, the most prestigious race in NASCAR. Known for its unparalleled sight-lines, daunting high banks and speeds up to 200mph; it now has the fan facilities to match this level of excitement. In January 2016, a $400m project to provide visitors a fully immersive fan experience was completed. The brand new DAYTONA stadium is a fitting tribute to the groundbreaking meeting place envisioned by car enthusiast, Bill “Big Bill” France Sr. back in the 1950s.

In 1948, Big Bill organized a meeting with drivers, mechanics and car owners to discuss the problems in stock car racing. Soon after the National Association for Stock Car Auto Racing (NASCAR) was born.

By 1953, Big Bill knew a permanent track was needed to accommodate the large crowds that gathered for races. In 1959, Daytona International Speedway® opened. With its banked design to enable higher speeds and safer, better viewing for fans, it was his vision of a superspeedway experience. Ever since, it has been the USA’s flagship motorsports facility and home to the DAYTONA 500®, NASCAR’s most prestigious annual race.

Our vision – bigger, faster and unmatched in the sporting industry

The DAYTONA Rising programme was guided by Joie Chitwood III, then President of the Daytona International Speedway and currently the COO of International Speedway Corporation. He talked us through the transformational 2.5-year program of work that took place in a live environment with the facility operational. Chitwood said: “Our aim was to live up to the vision that Big Bill had in the 1950s. Just as in 1958, we were doing something special. Racing on the beaches was part of the 1930-50s Florida scene. Bill wanted to move to a speedway but it took determination, vision and imagination. He pictured something bigger, faster and more impressive than anything anyone had seen. We pictured turning that same speedway into a true stadium, a first for motorsports with everything that entailed.”

Our vision – bigger, faster and unmatched in the sporting industry

In 1935, Big Bill loved everything about cars from a young age. He learnt about beach races in Daytona, Florida and moved there with his family in 1935. The early days of racing were disorganized and controversial, with poor driving conditions and infrequent payouts.

Over the years the track has had minor renovations; repaved in 1978 and 2010, lights added in 1998, and the infield renovated in 2004. The 2013 redesign was the first all-encompassing renovation program in the venue’s 57-year history.

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Over the years the track has had minor renovations; repaved in 1978 and 2010, lights added in 1998, and the infield renovated in 2004. The 2013 redesign was the first all-encompassing renovation program in the venue’s 57-year history.

By 1953, Big Bill knew a permanent track was needed to accommodate the large crowds that gathered for races. In 1959, Daytona International Speedway® opened. With its banked design to enable higher speeds and safer, better viewing for fans, it was his vision of a superspeedway experience. Ever since, it has been the USA’s flagship motorsports facility and home to the DAYTONA 500®, NASCAR’s most prestigious annual race.

Bill “Big Bill” France, Sr. loved everything about cars from a young age. He learnt about beach races in Daytona, Florida and moved there with his family in 1935. The early days of racing were disorganized and controversial, with poor driving conditions and infrequent payouts.

In 1948, Big Bill organized a meeting with drivers, mechanics and car owner to discuss the problems in stock car racing. Soon after the National Association for Stock Car Auto Racing (NASCAR) was born.
We realized that if we were going to transform DAYTONA into a stadium that would be future proof for generations to come, we needed best-in-class partners. That ultimately led to our partnership with Kingspan who provided a range of sustainable, advanced panel technologies for our world-class facility.

A building and experience steeped with passion

Just as it was for Big Bill, racing has been Joie Chitwood’s life. Following in his famous grandfather’s footsteps, he joined his family’s entertainment business and went on to become both stuntman and precision driving specialist. After earning his business degree and MBA, he transitioned to the big time of motorsports, which ultimately led to his involvement in the DAYTONA Rising project. Chitwood concluded: “Daytona International Speedway® is a huge part of NASCAR’s history and the biggest of our properties. We hope people understand how unique this new property is. We want our brand new home of stock car racing to change the way people experience our sport. The huge investment in digital capability – such as free WiFi for at least 100,000 via over 400 access points to name just one of the new features – means we’re current in terms of technology but with an appreciation of where we came from. It’s big for our sport! Now we’re looking forward to applying the lessons learnt and best practices to our other tracks.” The opening ceremony in January 2016 was attended by Big Bill’s son, Jim France, and his granddaughter, Lesa France Kennedy. According to Chitwood, they were ‘blown away’ by what has become widely recognized as a true continuation of history.

Auto-inspired design innovation

Perhaps the most striking feature of the new DAYTONA stadium are the five expanded injectors (entrances) which connect fans via a series of escalators and elevators to a variety of immersive experiences. These sponsored entertainment zones, with no less than 1400 HD screen displays, are located on three levels of concourse and stretch all the way along the near mile-long frontage of the building. There’s now upgraded seating for 101,500 (with an opportunity to expand to 125,000), twice as many restrooms and triple the amount of concession stands. In addition, the Speedway has over 60 luxury suites with trackside views and a completely revamped hospitality experience for corporate guests.

A striking exterior element of the building, featuring shimmering white and bold colours with dynamic curves, was created using Kingspan’s Optimo™ and BENCHMARK by Kingspan Designwall™ 2000 embossed panels while another 400,000 square feet was constructed using metal wall systems by Morin, which enabled easy mounting and removal of sponsor logos. 80% of these metal panels were manufactured at Kingspan Insulated Panel’s North American HQ in DeLand, Florida, less than 20 miles from the DAYTONA stadium. A further 125,000 square feet of Kingspan insulated panels were used for interior temperate and air-conditioned fan sections.

Kingspan was honoured to be appointed the exclusive, single source provider for all metal panel solutions and to deliver a fully inclusive package and cladding system. Post delivery feedback identified easy sourcing, expertise and proximity to the construction as having enabled design flexibility and greatly increased speed to production.
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FROM EMISSIONS TO EFFICIENCY

OVER HALF WAY TO A NET-ZERO ENERGY BUSINESS

The word ‘sustainability’ creates different associations depending on whether we think about it from an individual point of view, or if we have the bigger picture in mind. For many, it’s very simply about looking after the planet. But there’s growing recognition that if we are to go on enjoying social, economic and technological advancements, there’s a huge job to be done to protect our world for future generations and minimise the inevitable financial impact of rising fuel costs in buildings. With the construction sector high on the list of industries able to have maximum impact on this global agenda, sustainable building is now paramount. There’s never been a more exciting time to be driving sustainability-focused innovation for the built environment.

“...Mitigation of greenhouse gas emissions from buildings must be a cornerstone of every national climate change strategy.”

Sylvie Lemmet, Director, United Nations Environment Programme (UNEP)

Together we have the opportunity to make our built environments more energy efficient, attractive, adaptable, environmentally sensitive and productive. The way we build can be more effective and reach higher standards than ever before. We can make our buildings really work for us; consuming and generating energy smartly to become real investments in our future.

Gene M. Murtagh, Chief Executive Officer, Kingspan Group PLC

“The building sector contributes up to 30% of global annual greenhouse gas emissions and consumes up to 40% of all energy. Given the massive growth in new construction in economies in transition, and the inefficiencies of existing building stock worldwide, if nothing is done, greenhouse gas emissions from buildings will more than double in the next 20 years..."
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Kingspan Magazine talks to Mark Harris, Divisional Building Technology Director of Kingspan Insulated Panel covering Western Europe, Middle East, Africa, South East Asia, and Australasia. Mark has led the Kingspan Group NZE Committee, who are responsible for delivering Kingspan’s Net-Zero Energy (NZE) initiative since it began in 2011. NZE acts as one of the Company’s most progressive means of contributing to the Company’s mission to deliver sustainable solutions to the construction industry.

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In 2011 the Kingspan Group made a commitment that the Company’s worldwide operations would be NZE by 2020, with an interim target of achieving 50% by 2016. This commitment was greeted with genuine optimism and a wholesome belief that the ambitious goal was achievable; seeing it simply as another exciting opportunity for Kingspan to bring its culture and deep-held values, centred around sustainability, to life while generating multiple benefits along the way. With no official outside definition of NZE, Kingspan decided to commit to all of its manufacturing facilities being powered by renewable energy on an aggregated basis across its estate in 2020. In making this pledge, Kingspan decided to include all energy use with no differentiation between electricity, gas and other fuels.

Mark said: “Establishing a lead position in providing sustainable products and solutions for the construction industry while operating a sustainable business ourselves continues to be at the heart of Kingspan’s vision. Regulatory change and increasing awareness among property owners and those leading design in the built environment is driving the development of low energy, low carbon buildings that are certified to global environmental standards, such as BREEAM, LEED, Estidama and Green Star. And increasingly we’re seeing countries implement ‘carbon taxes’, which means that there’s now an even greater financial incentive to build and refurbish with low energy, low carbon emissions, and low environmental impact in mind. “Challenging ourselves to become NZE within a nine-year time frame felt like a huge step into the unknown at the time. However, the pledge has brought a keen focus to absolutely everything that we do, and, in spite of our business changing shape rapidly in the interim period - growing in financial strength and in size by acquisition - we’ve managed not only to stay on track but also to get ahead of our target. Having set ourselves an ambitious 50% target in 2016 we are delighted to have reached 57% which is very exciting!”

Mark points to the requirement for all new buildings to be nearly NZE by 2020, outlined in the EU’s re-cast Energy Performance Buildings Directive (EPBD) in 2010 as a defining moment for Kingspan. The Company has always strived to be a thought-leader in its sector but in order to continue leading with innovation to satisfy the ever increasing sustainable building requirements, it became clear that it had to fully understand its own energy footprint and address carbon emissions at its own facilities as part of the process. Kingspan’s NZE initiative became the framework within which all sites now operate to drive progress. Utilising Kingspan’s wide range of energy efficient products as part of the NZE process has proved invaluable. It’s provided opportunities to test and validate product performance; learn about new ways to achieve more from existing products and operations; and, as a result, put the Company in an even better position to share this knowledge and experience for the benefit of customers and potential users going forward.

**KEY TECHNOLOGIES UTILISED TO HELP ACHIEVE NET-ZERO**

- Solar PV
- Small wind turbine
- Biomass CHP (combined heat and power)
- Smart Lite solutions
- Biomass heat
- Anaerobic Digestion
- Energy efficient motors and drives
- Solar thermal hot water systems
- Building Management Systems
- Heat Recovery
- Insulation solutions - panels, boards
- Kingspan Group are committed to Net-Zero Energy by 2020 – take a look at their progress to date which confirms that their 50% interim target has been achieved and exceeded with 57% renewable energy use in 2016.
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**THE JOURNEY TO NET-ZERO ENERGY**

Kingspan Group are committed to Net-Zero Energy by 2020 – take a look at their progress to date which confirms that their 50% interim target has been achieved and exceeded with 57% renewable energy use in 2016.

**Energy Costs**
- Light and heat costs as a % of turnover

**Energy Intensity** kWh per €m of turnover

**Carbon Intensity** CO2 tonnes per Km of turnover

**Renewable Energy Usage** Renewable energy used (GWh)

**On-site Energy Generation** Renewable energy generated on-site (GWh)

**Renewable Electricity Usage** Renewable electricity used (GWh)
Strategy and anticipate delivering tangible benefits for the company, our customers and the environment.

Mark explained how Kingspan is driving forward to deliver the 2020 target by the Save More - Generate More - Buy More system which in 2016 saved over 300MWh of electricity.

Kingspan Smart-Lite LED lighting facility in Hull, UK installed a facility in 2015. The total annual energy savings in 2016 were in the region of 2.5GWh energy savings will be in the region of 3.5GWh per annum of gas usage.

In 2016 we completed the installation of a 5MW solar PV array on our roof at Sherburn. This is believed to be one of the 5 biggest rooftop mounted solar PV systems in the UK. It will deliver over 400GWh of renewable electricity per annum.

Investments in energy recovery systems were made at seven Kingspan Insulation sites in Europe during 2015. The total annual energy savings in 2016 were in the region of 100GWh. Also in 2015, the Access Floors facility in Hull, UK installed a Kingspan Smart-Lite LED lighting system which in 2016 saved over 300MWh of electricity.

On-site generation is a key priority. Projects completed or underway include solar PV, solar hot water, biomass and wind.

In 2016 Kingspan was one of only 5800 companies that disclosed. 193 CDP A List companies out of the 5000 companies in the index for the second year running - as the only Irish listed company to receive this accolade it sends a powerful message to our stakeholders.

We were successful in procuring renewable gas for process heat and space heating. However, the market for renewable gas is now developing in the UK, some areas of Europe and North America. We were successful in procuring renewable gas for some of our facilities in 2016.

We are conscious that the renewable energy procurement landscape is changing and evolving rapidly and look forward to the development of innovative & legitimate procurement pathways in the future.

When I look back to 2011, the incredibly ambitious NZE ambition we had has turned into exciting reality that will continue to deliver benefits for the company and its stakeholders. The transition from fossil fuels to renewables is incredibly exciting - not least because we're demonstrating that it's not only possible, but extremely possible.
Mark explained how Kingspan is driving forward to deliver the 2020 target by the Save More - Generate More - Buy More system which in 2016 saved over 300MWh of electricity.

Kingspan Smart-Lite LED lighting facility in Hull, UK installed a 2.2GWh of heat energy in the form of hot water which is directed to the two heat recovery systems. The AD plant also provided 2.2GWh of heat energy per annum of gas usage.

In 2016 we completed the installation of a 1.5MW solar PV array on our roof at Sherburn. This is believed to be one of the 5 biggest roof mounted PV systems in the UK. It will deliver over 406Wh of renewable electricity per annum.

Projects completed or underway include solar PV, solar hot water, biomass and wind.

In our experience every site is different and needs to be targeted in a unique way. In our particular situation the optimum energy saving solution is often a combination of employee awareness, energy metering, building management systems, lighting upgrades with Kingspan Smart-Lite LED with digital addressable lighting interface (DALI) control systems, motor replacements, compressed air system upgrades, process heat control, fan optimisation measures and process heat recovery equipment.

2016 saw the full year impact of the Energy Performance Contract at Sherburn, UK. This EPC saved in the region of 2.5GWh energy savings in electricity, fuel oil and LPG. EPCs at Holywell, UK and Kingscourt, Ireland saved almost 20GWh energy in 2016.

Investments in energy recovery systems were made at several Kingspan Insulation sites in Europe during 2015. The total annual energy savings in 2016 were in the region of 10GWh.

Also in 2015, the Access Floors facility in Hull, UK installed a Kingspan Smart-Lite LED lighting system which in 2016 saved over 300MWh of electricity.

The procurement of renewable energy is a key part of our strategy. We aim to procure fully certified renewable energy as far as possible. In Europe and North America the market for renewable electricity is well developed with the availability of Guarantees of Origin (GOs) and Renewable Energy Certificates (RECs) in the respective markets. In other countries we are looking at RECs and other instruments to help render our electricity renewable.

Probably the biggest challenge that we face is the procurement of renewable gas for process heat and space heating. However, the market for renewable gas is now developing in the UK, some areas of Europe and North America. We were successful in procuring renewable gas for some of our facilities in 2016.

We are conscious that the renewable energy procurement landscape is changing and evolving rapidly and look forward to the development of innovative & legitimate procurement pathways in the future.

Commenting on the positive progress Mark said: “Being able to see such substantial improvements enables us to demonstrate the business case for investing in energy efficiency and renewable energy generation to our stakeholders around the world. These are fantastic ways for us to bring the value proposition of our products and solutions to life in such a tangible way. In 2016 we were delighted to have been given A-List ranking on the CDP Climate Performance Leadership Index for the second year running - as the only Irish-listed company to receive this accolade it sends a powerful message to our stakeholders.

“But we’re not just looking inwards. The NZE initiative has very much challenged us to take a 360-degree view and we’re involving ourselves in other external programs to increase our chances of success. One example is our joining RE100, a group of companies including Bloomberg, Coca-Cola, Google, Philips, Sky, Starbucks, Unilever and Walmart, which all support the use of renewable power. The RE100 community is a valuable network for like-minded organizations to benefit from peer to peer learning and sharing of best practices. By joining initiatives like RE100 we hope to share our knowledge to help accelerate our collective long term goal.”

When I look back to 2011, the incredibly ambitious NZE ambition we had has turned into exciting reality that will continue to deliver benefits for the company and its stakeholders. The transition from fossil fuels to renewables is incredibly exciting - not least because we’re demonstrating that its not only possible to achieve Net-Zero but so far the journey has delivered tangible financial benefits for the company and has proven the business case for investment in energy efficiency, renewable energy generation and renewable energy procurement to our wider stakeholder community. Although we exceeded our 2016 interim target by 7% Kingspan is certainly not resting on its laurels, that simply does not fit with the Company’s culture. Mark concluded.

In 2016 Kingspan was one of only 193 CDP A List companies out of the 5800 companies that disclosed.
Visitors to the brand new Action Stations Experience at the Australian National Maritime Museum (ANMM) are sure to be impressed by the wonderful architectural space, which uses insulated panels from the BENCHMARK by Kingspan range to create a uniquely striking, warm welcome to the building. The scheme, envisioned by the highly talented team at fjmt studio, one of only seven architectural practices to receive the prestigious World Building of the Year Award, has already helped to boost visitor numbers at the attraction. Kingspan Magazine finds out more about this landmark project.
MAKING A SPLASH

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A building for high-tech drama

Located in an extension to the Warships Pavilion at the Australian National Maritime Museum in Sydney’s Darling Harbour, the new Action Stations immersive experience was completed in June 2015 to mark the centenary of World War I. As a significant development project for the Museum, the design of the building was critical. It had to be architecturally beautiful while functioning super-efficiently at maximising the high-tech experience of the danger and drama of Navy life for visitors.

Clear vision for the enhancing the waterfront

The team at the ANMM had a clear vision for the Action Stations project. “We wanted to strike a balance between making a strong architectural statement that complements our existing buildings and the city beyond while not overpowering the vessels that are currently exhibited adjacent to, and within the Pavilion. We also wanted to provide a warm welcome and to create a sense of drama and anticipation for visitors approaching this lively part of the waterfront. Above all, I guess it was about setting a new benchmark in the way that we deliver an unforgettable experience for our visitors who come here wanting to celebrate the past, present and future stories of the men, women and ships of the Royal Australia Navy.”

Form and function make great design

Development of the Pavilion’s structural design created an opportunity for transparency on both sides of the building, enabling glimpses of the vessels through the building where possible and maintaining a connection to the outdoor displays through the ships’ silhouettes. The form was inspired by the techniques and geometrical rigour of boat building while the conceptual approach closely referenced the wake of a boat as it passes through water. BENCHMARK by Kingspan’s Evolution panels were the perfect solution to generate the external and internal geometry as one; a smooth, sleek, contemporary finish with built-in premium functionality offering exceptional durability plus lifetime insulation continuity, thermal performance and airtight certainty.

Design + Build Detail

fjmt studio’s scheme required 891m² of wall panels slim enough to maximise the internal space for visitor comfort while maintaining thermal resistance values. The pavilion façade had to be generated as a series of complex geometrical rotations of 1m wide panels sized to maintain the efficient use of Kingspan’s standard widths. The biggest challenge was creating these complex façade geometries while maintaining a watertight external skin at the joint intervals. Inclusion of a glass oculus, comprising 1m wide panels of glass, added to the complex design challenge. The harbour location also meant that the exterior had to be fully weatherproof in order to maintain its characteristic colour and finish.

Delivering excellence

All of these challenges were met seamlessly with the fjmt studio team working in close partnership with the technical team at Kingspan. James Perry, Senior Associate at fjmt studio said: “Each BENCHMARK by Kingspan panel was manufactured locally to our detailed specification. The premium panels are fantastic to work with; fast and efficient installation meant we kept costs down, minimised waste and we were ready to hand the building over to the Museum team ahead of schedule. The extended thermal, structural and paint coating warranties that come as part of Kingspan’s offer were one of the key elements in our decision to use the Evolution range and were an important consideration for the ANMM team.”

“We’ve ended up with something that I am immensely proud of. fjmt studio took our vision and translated into something even more spectacular than we could have imagined. Adding in the cleverness of modern building materials – in the form of Kingspan’s Evolution panels – and we have created an incredible building that will be here for generations.”

Bianca Wong, Sustainability Manager at Kingspan

Bianca played a critical role in the delivery of the scheme. Understanding the architectural intent, she worked with the project teams to optimise the benefits of Kingspan’s insulated panel technology thus achieving the desired aesthetic and performance outcomes.

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“We’re absolutely delighted with the new Action Stations building. Working with the delivery teams has been a revelation – I feel I know so much more now about these amazing modern materials that can, quite literally, turn an architect’s visions into reality. And I know when I see the look on our visitors’ faces as they approach this part of the Museum that we’ve truly achieved our own vision. A very exciting experience awaits all our future visitors.”

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BENCHMARK by Kingspan Evolution range

- Lifetime insulation continuity,
- Thermal performance,
- Airtight certainty
- 3D recessed joint details

891m² panels
With geometric arrangement at 1m intervals and including glass oculus

Excellent fire performance
Sustainability
Green Guide A* rating

Time Saved
Accelerated build speed with pre-engineered single fix installation

Plus...
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IN BRIEF
AUSTRALIAN NATIONAL MARITIME MUSEUM

Location: Sydney, Australia
Products: BENCHMARK by Kingspan
Evolution range

BENCHMARK by Kingspan Evolution range

- Panels can be cranked, mitred and curved and are available with an impressive range of connection details
- 891m² panels with geometric arrangement at 1m intervals and including glass oculus
- Excellent fire performance
- Sustainability
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Daylight is one of the most vital, natural elements in our daily life. On the simplest level, a clear blue sky lifts our spirits and energizes our day. But there’s a growing body of evidence that proves beyond doubt that bringing daylight into buildings - where we spend 90% of our time - significantly improves our health and well-being, makes us more productive and has a positive impact on the environment and business costs. Kingspan Magazine shares some current thinking on the growing movement to create more holistically successful buildings.
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It is estimated that today around 90% of a business’ operating costs are staff-related, so it stands to reason that even the most modest intervention to enhance employee happiness, health and wellbeing will have a compounded positive effect, individuals feel better, businesses benefit - saving money among other things – and, guess what – the planet breaths a sigh of relief!

So what’s behind these super-positive claims about daylight?

First, let’s look at the people factor. Human beings are generally happy to work, rest and play, which, for most of us, means sleeping at night and finding a healthy mix of work and play during the day. Our brains function and respond to the stimulus of daylight; it helps regulate our circadian rhythms, boosts the effectiveness of vitamin D and helps the efficient development of serotonin and melatonin to positively affect our mental and physical health as well as contributing to a sense of happiness and wellbeing. It’s pretty clear then that daylight is a fundamental for people to function well.

Translating this fundamental need for natural daylight into what it means for schools, hospitals, places of work, and recreational spaces there are some fascinating facts emerging. In an article entitled ‘Why natural light matters in the workplace,’ that appeared in Eco-Business earlier this year, wellness and sustainability expert, Ash Buchanan cited reports by the World Green Building Council, International Building Institute and Human Spaces, which bring together a wealth of academic research on how the presence of natural elements can promote health, wellbeing and productivity.

Of all the elements, daylight has been found to be the number one wanted natural feature in the workplace. When you dig deeper into the findings it is easy to see why. Interestingly, office workers with natural elements such as greenery and sunlight4 feel better, businesses benefit – saving money among other things – and, guess what – the planet breaths a sigh of relief!

For natural daylight in commercial and industrial buildings. The environmental impact of harnessing natural daylight is immediately clear. For a start, there’s the lower demand for electric lighting and saving on heating costs with reduced CO2 emissions as a result. More windows are not the only solution. By contrast, improvements in daylight materials and optical technologies mean that total roof area – are now even more effective at allowing light to flood into, and illuminate a space. Furthermore for building owners looking to maximise Solar PV, the higher performance rooflights can be used in lower ratios, thereby increasing the available roof space. Smart thinkers will go one step further and look to holistically design a buildings lighting system by combining the benefits of daylight with smart LED lighting for a fully integrated solution that enhances occupancy comfort with reduced building energy costs.

Dr. Miguel Paya-Marin Ph.D., UK BREAM AP and ACIAT member is Head of Sustainability Innovation Management at Kingspan Insulated Panels. He has been instrumental in the company’s innovative work on, and application of new generation roof light products. One of the latest, Zer0 Energy Lighting, is an intelligent system suitable for use in buildings of all kinds. Zer0 Energy Lighting combines roof lights, LED lighting with smart controls and photovoltaic technology in one single package. Miguel said: “Kingspan’s pursuit of 100% Net Zero Energy for our own facilities by 2020 has driven substantial investment into innovation, which helps to continually bring exciting new solutions to our customers too. The whole area of lighting and solar capture is hugely important. I believe Zer0 Energy Lighting is the most cost-effective lighting solution available to businesses today, taking into account capital and O&M costs, while also improving the wellbeing and productivity of a building’s occupants and improving environmental performance. Kingspan is very much about envelope solutions and so of course light is an important factor. These new products and the way in which we work seamlessly with designers, engineers and the construction team to calculate a bespoke package for each installation is what sets us apart and makes us a special partner.”

An independent study, commissioned by Kingspan, found that Zer0 Energy Lighting solutions had the potential to produce the following results:

<table>
<thead>
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<th>Result</th>
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<td>£21,746 decrease in electricity bills for the average UK business</td>
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While the report examines the impact of improved lighting and controls, it does not include the additional potential cost savings and benefits of the rooftop Solar PV element nor does it explore the health, wellbeing or direct environmental impacts. Factoring these in creates a very compelling case for the specification of a Zer0 Energy Lighting system in future new build and refurbishment projects.

Quotations:
3. OR10_ Daylighting%20Bias%20and%20Biophilia.pdf Last accessed 5 August 2014

Dr. Miguel Paya Marin, Head of Sustainability Innovation Management
Workplaces with good daylight had up to 40% gain in productivity and sales; view quality and daylight explained a 6.5% variation in sick leave, while creativity in another study rose by 15% in spaces with natural elements such as greenery and sunlight. For natural daylight in commercial and industrial buildings, the environmental impact of harnessing natural daylight is immediately clear. For a start, there’s the lower demand for electric lighting and saving on heating costs with reduced CO2 emissions as a result. More windows are not the only solution. By contrast, improvements in daylight materials and optical technologies mean that total roof area – are now even more effective at allowing light to flood into, and illuminate a space. Furthermore for building owners looking to maximise Solar PV, the higher performance rooflights can be used in lower ratios, thereby increasing the available roof space.

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**References**


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**Image sources**

Kingspan’s invention of QuadCore™ Technology is a transformational step on the journey to creating net-zero energy buildings that are not only safer, but better for the environment and for business too.

If you’re looking for the highest thermal performance the industry has to offer with superior fire protection and leading environmental credentials then our brand new, QuadCore™ Technology insulated panels are what you need for your next challenger project.

Let’s take a look at what makes QuadCore™ Technology such a fantastic addition for future buildings…

**Higher building performance with Kingspan**

**It's all in the grey cells**

Kingspan’s QuadCore™ Technology delivers superior U-value performance with an unbeaten thermal conductivity of 0.018 W/m·K* - the best in the industry.

Together with optimised building design, this pushes the potential for heat loss reduction to reach new levels. Better thermal efficiency in the building envelope reduces the load on heating and cooling, which unlocks significant additional energy savings.

Today’s buildings must be safe, efficient, reliable, practical and sustainable. Above all, they must provide a comfortable environment for users while satisfying regulations and having minimal impact on our environment. QuadCore™ Technology helps deliver all of this and more. In fact, we guarantee that whatever direction the building takes, the thermal and structural performance will last.

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**Superior fire protection**

Kingspan’s QuadCore™ Technology is the only closed-cell insulated panel material tested and approved by third party industry experts to FM 4882 for smoke sensitivity. It also has insurer certified FM and LPCB approval. It’s reassuring to know that our QuadCore™ Technology will deliver industry-leading protection against the dangers of fire.

Just another way we’re offering a peace of mind built into a material solution.

**Enhanced environmental credentials**

QuadCore™ Technology delivers higher environmental credentials leading to important green ratings for your building. In addition, carbon emissions can be reduced with QuadCore’s better thermal performance, particularly when implemented with an optimised building design approach.
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ECHOING COLOUR

Optimism from strong economic growth forecast for Newport, Wales, meant the city was ready for step-out development work to revitalise its core and in November 2015, Friars Walk opened to the public. Already a vibrant urban hub for the local community and visitors to this University City, the new retail and leisure development, featuring Kingspan’s integrated systems and building technology, has already exceeded expectations. Kingspan Magazine tracks the design vision through to delivery of this unique new space.

Harmonising town and country
London-based architects, Leslie Jones Architecture (LJA), are specialists in the retail/leisure and mixed-use sector and have a proven track record in urban place-making schemes.

Brian Tracey, Director at LJA explained: “The design philosophy was to come up with a series of buildings each with their own character that used a palette of materials that were referenced back to the locality. We used brick, we used timber and we used the coloured panels from Kingspan to tie back to the greenness of the hills and the terracotta colours of the brickwork and the stone that exists within the town centre.”

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Design + Build detail

From the beginning, Kingspan worked seamlessly with LJA and the contractor team to come up with creative solutions to the design challenges. These included the development of bespoke ancillaries, including vertical rails for the hook-on cassettes, factory-bent corner cassettes to give a smoother look, flashings made to match the thickness of the cassettes at strategic reveal points, and a penetrating steel fixing solution for store signage.

One of the largest buildings on the site was designed for retailer Debenhams. Being adjacent to a narrow street, it was important that it did not feel overpowering. The architects worked closely with Kingspan to determine the final scheme in which more than 2,000m² of BENCHMARK by Kingspan’s Rainscreen Façade System panels with aluminium hook-on cassettes were used; four different shades of green and grey in matt and gloss finishes created the perfect look.

Next, a cinema complex with a colourful terracotta façade incorporating LED lighting was designed to ensure the building made an equally arresting impression at night.

Design flexibility, a single point of supply, superior thermal insulation and airtight performance, which achieved BREEAM ‘Excellent’ rating, were all key to the selection of the BENCHMARK by Kingspan’s Rainscreen Façade System. It also meant the contractor was able to quickly create a weather-tight building, giving an early green light to the internal fit out and faster route to handover to the client, Queensberry Real Estate.

How did Friars Walk measure up?

Since opening, feedback has been overwhelmingly positive. Footfall is above target and has also increased by 40% at neighbouring Kingsway Centre as Friars Walk draws more people to the city. While Simon Pullen, Operations Director at Queensberry Strategic Property Management is delighted with the easy maintenance and high energy efficiency of the building, Martin Tewdiddler, Project Director, commented: “The main challenge for Friars Walk was the sheer build speed required - a 21-month project by any measure is breakneck speed for a retail scheme of its scale. We were delighted with how the teams from Kingspan, LJA and the contractors worked together to deliver this transformational scheme to the heart of Newport.”

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A climate for change
Our planet is facing big challenges – and we want to play our part in finding a lasting solution. We’re working thoughtfully and innovatively to drive change, to help you create the energy efficient buildings the world needs right now. We have also committed to becoming a Net-Zero Energy company ourselves by 2020.

About Kingspan Insulated Panels

Local experts with global knowhow
Whether you’re pushing boundaries in design or technology or simply exploring new options, we offer you the reassurance of technical experts you can trust. As a customer or partner, you can talk to one of our 20 centres of research excellence around the world – all staffed by professionals with the knowledge, passion and technology to innovate and adapt products to make a practical input into your successful projects.

50+ years of manufacturing quality
Our passion for manufacturing enables us to provide exceptional quality solutions. Attention to detail is what drives us – being able to offer you the best of the best. Every system, the very way we operate is set up to make that happen.

Grifols pharmaceuticals, Ireland

Intrinsic Charter School, UK

WWTF office & Warehouse, Germany

Leda Aerospace

SJ Quinney, US

Intrinsic Charter School, UK
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KINGSPAN MAGAZINE

Kingspan magazine celebrates the vibrant world of architecture, design and the built environment. It explores potential and opportunity; it digs deep into design solutions, engineering and delivery. It challenges convention and seeks new ways to create better, more energy efficient solutions for future construction.

Kingspan magazine is also available online at kingspanmagazine.com